

**COMPLYING WITH NFPA 1710: AN ANALYSIS OF THE MIAMI-DADE FIRE
RESCUE DEPARTMENT'S RESPONSE TIMES**

STRATEGIC MANAGEMENT OF CHANGE

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ABSTRACT

The problem was that the Miami-Dade Fire Rescue Department (MDFRD) had not determined if it met the response time criteria contained in National Fire Protection Association (NFPA) Standard 1710. The purpose of this research was to determine if the department met the response time criteria listed in NFPA 1710 and to provide recommendations for improvement of response times.

This research project employed a descriptive research methodology to determine: (a) what the components of fire and emergency response time are, (b) what the response time requirements of NFPA 1710 are, (c) what MDFRD's response times are, (d) if MDFRD was compliant with the response time requirements of NFPA 1710, and (e) what steps can be taken by MDFRD to comply with the response time requirements of NFPA 1710.

NFA, Library, and Internet literature review was conducted. Applicable information was reviewed and summarized.

Interviews were conducted with department employees who collect, analyze, monitor, report and utilize response time data. They provided suggestions for improving response times. An IAFF Local 1403 representative who was a Technical Committee member for NFPA 1710 was also interviewed.

Response time data for 2001 was collected and analyzed to determine whether Miami-Dade Fire Rescue was in compliance with NFPA 1710.

Of the nine response time steps identified in the literature review, this research focused on the three steps that fire departments can control: alarm processing, turnout, and travel time.

NFPA 1710 requires that a fire company arrive within four minutes plus one minute for turnout time; a full alarm assignment within eight minutes. For EMS incidents, the standard requires a four-minute response time for BLS calls and eight-minutes for ALS calls. For both response categories, the performance objective is 90 percent.

MDFRD's response times for structure fires in 2001 range from 22 to 32% performance for initial arriving unit within 5 minutes and 56 to 66% performance for arrival of the initial assignment within nine minutes. For EMS calls, the range for 2001 was 83 to 85% performance for a nine-minute arrival time on ALS calls and 20 to 22% for a five-minute response to BLS calls. The department was not meeting the NFPA 1710 response time criteria.

Recommendations included conducting a risk analysis to identify areas for improvement, monitoring and reporting response times as a quality management program component, and revision of the department's strategic plan to reflect NFPA 1710. CAD implementation with newer technology and the new radio communications system should improve times.

Monitoring and reporting must continue. The information should be made available to all department personnel, possibly expanding the use of the department's Intranet Homepage. A formalized quality management program would facilitate evaluation and identify response time performance shortfalls.

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INTRODUCTION

The problem was that the Miami-Dade Fire Rescue Department had not determined if it met the response time criteria contained in the National Fire Protection Association (NFPA) 1710, Standard for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.

The purpose of this research was to determine if the Miami-Dade Fire Rescue Department met the response time criteria listed in NFPA 1710 and to provide recommendations that will ensure periodic review and continuous improvement of response times.

The descriptive research method was used to answer the following questions:

1. What are the components of fire and emergency services response time?
2. What are the response time requirements of NFPA 1710?
3. What are the response times for the Miami-Dade Fire Rescue Department?
4. Is the Miami-Dade Fire Rescue Department presently compliant with the response time requirements of NFPA 1710?
5. What steps can be taken by the Miami-Dade Fire Rescue Department to comply with the response time requirements of NFPA 1710?

BACKGROUND AND SIGNIFICANCE

The Miami-Dade Fire Rescue Department provides fire suppression, Emergency Medical Services, Hazardous Materials, Technical Rescue and other emergency services to unincorporated Miami-Dade County and the 26 municipalities that comprise

the Miami-Dade Fire Service District. Miami-Dade County spans 2000 square miles and the fire district serves a resident population of 1.6 million people.

Generally, the northern end of the county is densely populated, with many high-rise condominium and apartment buildings. The central area is also densely populated and consists primarily of low-rise apartments, single-family residences, and many commercial and industrial occupancies. The southern end of the county is more sparsely populated and it includes agricultural areas.

In 1994, Miami-Dade County voters approved a 59 million dollar bond referendum. The foremost goal of this referendum was to improve service to the community by decreasing response times. A total of thirteen million dollars was earmarked for the construction of ten fire stations. The locations for these fire stations were identified through a comprehensive review process that included analyzing population growth trends, areas with relatively high call volume and areas considered underserved.

Miami-Dade Fire Rescue has been aware of the importance in improving its response times for more than 15 years. Community representatives, governing bodies, and elected officials frequently request response time data to compare with other departments. In the past 10 years, six donor communities in Miami-Dade County have incorporated. One of these cities formed a fire department.

Gaining the support of voters for the 1994 bond referendum required educating the community on the importance of improving the department's response times to serve a growing population. As a result, communities became aware of a fire and emergency service best practice and naturally, they expect the department to be accountable.

Strategic Goal #1 of the department's Strategic Plan is "To reduce response time throughout our jurisdiction" (Miami-Dade Fire Rescue, 2001, p 1). The first objective under Goal #1 is "Within the Urban Development Boundary, respond to life-threatening calls within 6 minutes 80% of the time during the fiscal year" (Miami-Dade Fire Rescue 2001, p 1). Chief J. Wesley explains that although the plan's goals and objectives are not listed in priority order, he feels that undoubtedly, reducing response times is the department's main concern (personal communication, December 27, 2001).

In 1998, NFPA attempted to approach the subject of response time, however, opposition to the standard was strong. Standard 1200 was never approved, writes Pendleton (1999).

Approval of NFPA 1710 has provided a benchmark to the public to measure the performance of their fire and emergency departments.

Article 24.1 of the collective bargaining agreement between Metro-Dade Fire Fighters Local 1403, IAFF and Miami-Dade County states: "All protective clothing, equipment, tools, appliances, and apparatus will meet or exceed NFPA safety standards..."(Miami-Dade County, 2001). Gary Rainey, IAFF Local 1403 Secretary states that, although Article 24.1 refers specifically to safety equipment and apparatus, he believes the article covers standards such as NFPA 1710. He further explains that the language in the agreement was written prior to operational standards being developed by NFPA (personal communication, December 6, 2001).

The significance of this study to Miami-Dade Fire Rescue is fourfold:

1. The recommendations from this applied research project will be incorporated into the department's strategic plan

2. The information and recommendations in this research project will form the foundation to ensure the department meets NFPA 1710 criteria.
3. The information will serve as a model for future studies.
4. Finally, this research should prove beneficial to other departments in measuring and improving their response times.

The impact of the department reporting inconsistent response time data has internal as well as external implications. Accurate reporting is essential to maintaining the public's trust. Pendleton (1999) writes that actual or perceived excessive response times can negatively affect incident outcome and customer relations.

"We have implemented several response time reduction initiatives. Among these measures are: implementing two peak-load ALS units, two peak-load BLS transport units, a major fire station construction program, and enabling a printout with incident dispatch information at the station." (B. Matthews, personal communication, November 29, 2001)

This applied research project was conducted as part of the requirements for the National Fire Academy Strategic Management of Change course. This research directly relates to areas of the course including: Module 1, Introduction to Change Management that discusses the role technology such as Computer-aided dispatch systems play in the evolution of the fire service and Module 2 The Change Management Model, Phase 1 – Analysis. This research project relates to this section in that the current response time status of the Miami-Dade Fire Rescue Department was analyzed using the model to determine what changes need to be made.

LITERATURE REVIEW

There is little doubt that measuring one's performance and striving to make necessary adjustments is the most effective way to accomplish one's mission. Many factors must be considered when evaluating a fire department's effectiveness. For example, Hoetmer (1996) proposes measuring the time it takes to control or contain a fire is suggested as a benchmark in measuring the effectiveness of fire suppression activities.

Coleman mentions the tendency to believe that fire departments will arrive within four minutes of a fire starting and if response time is the only measurement of a fire department's performance, we are being misled (2001).

In his EFO paper, Mason (1996 p 6) states "It is known that flashover is likely to occur within 6 to 9 minutes and that after it occurs damage will be far greater than if the fire is extinguished prior to flashover."

1. What are the components of fire and emergency services response time?

The Commission on Fire Accreditation International's Self Assessment Manual (1997) defines response time as the total amount of time that elapses from the time a communications center receives an alarm until the responding unit is on the scene of the emergency and prepared to control the situation.

"Calculating response times based on the elapsed time from the initial call for assistance until the first unit arrives are more in line with the public's expectations. Citizens want a rapid response to their request for assistance" (Paul, 1995, p. 111)

Relating to EMS response, Rural/Metro Medical Services (2001) explains that the time it takes for emergency medical personnel to reach a person in need is the most

widely used measure of EMS quality, but it is often misunderstood. The article lists the following components of the total time it takes EMS to reach a patient: “

1. The time it takes for someone to realize an event is a medical emergency,
2. The time it takes for someone to call for help,
3. Access to 911,
4. Evaluation of the need for EMS by a call-taker and call transferred to Rural/Metro,
5. Call-taker information collection (problem, location),
6. Selecting and alerting the appropriate emergency vehicles,
7. Emergency vehicles starting time,
8. Time to travel to the patient's location,
9. Arrival at the patient's side.”

Wilson (1994) describes nine time intervals from when a fire is ignited to the point of extinguishment. Free burn, permitted burn, and notification are the first three steps and are largely beyond the immediate control of the fire department. The alarm processing step, the turnout step, and the travel step are the following steps. These steps can be addressed and targeted for improvement by fire departments.

Pendleton (1999) describes turnout time as the period of time in which the firefighters get ready to respond. He states “Turnout times will be longer for fire calls when firefighters clothing needs to be donned and at night when firefighters are responding from sleeping quarters” (Pendleton, 1999 p 11).

Pendleton (1999) describes the travel step as the time period that begins when the apparatus starts to respond to the call and ends at the time it arrives on the scene.

Dawson (1999) found that response times reported as an average for all responses, could lead to false expectations for the public and fire departments having to explain an extended response time. He further notes that the public more easily understands reporting a range of response times and it is easier to demonstrate the normal responses people can expect.

The Miami-Dade Fire Rescue Department often reports response times from the time the call is dispatched until the first unit arrives on the scene (B. Matthews, personal communication, November 29, 2001). This method of reporting response times does not account for the elapsed time from when the call is placed to the time personnel are notified, the alarm processing step.

2. What are the response time requirements of NFPA 1710?

Following are the requirements for response time as stated in NFPA 1710:

4.1.2.1.1 The fire department shall establish the following time objectives of:

(1) The time objective for turnout time shall be one minute (60 seconds).

(2) Four minutes (240 seconds) or less for the arrival of the first arriving engine company at a fire suppression incident and/or 8 minutes (480 seconds) or less for the deployment of a full first alarm assignment at a fire suppression incident.

4.1.2.1.2 The fire department shall establish a performance objective of not less than 90 percent for the achievement of each response time objective specified in

4.1.3.2.1.

The standard takes into account the fact that there are times when a first-due engine company may be unavailable, therefore, the following is from the explanatory material contained in Annex A of the standard:

A.4.1.2 There can be incidents or areas where the response criteria are impacted by circumstances such as response personnel who are not on duty, nonstaffed fire station facilities, natural barriers, traffic congestion, insufficient water supply and density of population or property. The reduced level of service should be documented in the written organizational statement by the percentage of incidents and geographical areas for which the response time criteria is achieved.

A.4.1.2.1. (2) This service delivery requirement is to have fire departments plan and situate their resources to consistently meet a 4-minute initial company fire suppression response and an 8-minute full alarm fire response assignment.

However, it is recognized that while on some occasions (for example, a company is out of service for training) the initial company response may not be met in the 4-minute requirement, but the 8-minute criterion must always be met.

For Emergency Medical Services, the objectives in the standard are:

1.3.3.4.2. The fire department's EMS for providing first responder with AED shall be deployed to provide for the arrival of a first responder with AED company within a 4-minute response time to 90 percent of the incidents as established in Chapter 4.

1.3.3.4.3. When provided, the fire department's EMS for providing ALS shall be deployed to provide for the arrival of an ALS company within an 8-minute response time to 90 percent of the incidents as established in Chapter 4.

3. What are the response times for the Miami-Dade Fire Rescue Department?

Matthews (personal communication, January 24, 2002) explains that, since the fire rescue district covered by the department varies significantly in population density, especially in the south and the western fringes, a distinction is usually made between calls within and outside the urban development boundary. In addition, calls are categorized as life threatening and non-life threatening.

The department's Management Information Technology Division provides several tools for personnel to review unit response times. One of the reports, available on the department's intranet shows the number of dispatches to incidents and average travel time by work shift (L. Cutie, personal communication, January 11, 2002).

"Response times for life-threatening calls are now being reported to the County Manager's office quarterly based on the October to September fiscal year" (J. Wesley, personal communication, January 10, 2002)

4. Is the Miami-Dade Fire Rescue Department presently compliant with the response time requirements of NFPA 1710?

The Miami-Dade Fire Rescue Department Intranet site was accessed to review response time data for 2001. The department's strategic plan lists the strategic objective "Within the Urban Development Boundary, respond to life-threatening calls within 6 minutes 80% of the time during the fiscal year" (Miami-Dade Fire Rescue 2001, p 1). Progress reports to the Miami-Dade County Office of Performance Improvement were reviewed to determine at what level the department's response times meet the stated objectives.

5. What steps can be taken by the Miami-Dade Fire Rescue Department to comply with the response time requirements of NFPA 1710?

The International Association of Fire Chiefs points out that the standard requires departments to conduct a risk analysis of their communities to identify where it will be unable to meet the standard and formulate a written plan to address the areas (IAFC p 27).

McGinnis (1997) recommends several strategies to address traffic-related delays, such as traffic lights, speed bumps, and other obstacles. He suggests fire departments should work with community and local government in traffic management. He also offers that crews can create maps for their response areas depicting the best routes.

Suggestions from personal communications with Miami-Dade Fire rescue personnel yielded the following suggestions: B. Matthews (personal communication, January 24, 2002) (a) completion of the updated radio communications system, (b) Implementation of the computer-aided dispatch (CAD) system with mobile data terminals, (c) peak-load rescue units, and (d) advising Battalion Chiefs when their units have extended response times, to be a component of a quality management system.

L. Cutie (personal communication, January 11, 2002) shared the following suggestions: (a) Ensure that the CAD system incorporates Geographic Information Systems (GIS) and Global Positioning System (GPS) technology and (b) continue to monitor response times and make the figures available to all personnel and perhaps implement a reward system for the most improved annually.

The literature search produced more than ten times the number of citations for response times than for NFPA 1710. However, the information proved essential to this

research project. Equally important was the insight that was gained through personal communications with department personnel responsible for various areas of response time collection, analysis, and reporting.

The literature review provided findings and observations from authors who examined different size fire departments. All of the literature stressed the importance of an expeditious response and how essential it is to a safe and successful outcome.

PROCEDURES

Research Methodology

This research project employed a descriptive research methodology to determine: (a) what the components of fire and emergency response time are, (b) what the response time requirements of NFPA 1710 are, (c) what the Miami-Dade Fire Rescue Department's response times are, (d) if the Miami-Dade Fire Rescue Department was compliant with the response time requirements of NFPA 1710, and (e) what steps can be taken by the Miami-Dade Fire Rescue Department to comply with the response time requirements of NFPA 1710.

The initial step in this research project was the development of a problem statement, describing the fact that the Miami-Dade Fire Rescue Department had not determined if it met the response time criteria contained in National Fire Protection Association (NFPA) Standard 1710.

Literature Review

The literature review began with a computer search of the card catalog of the Learning Resource Center at the National Fire Academy. Literature review was also

conducted at the Miami-Dade County Public Library, the Miami-Dade Fire Rescue Department Library and on the Internet.

The literature review consisted of textbooks, magazines, trade journals, technical reports, and EFO Papers that contained information related to emergency services response time and specifically, NFPA 1710. Applicable sources were summarized and included in the Literature Review section of this report. Also reviewed were Miami-Dade Fire Rescue Department's Policies and Procedures and Operations Standard Operating Procedures.

Internet searches returned more than 200 sites and articles related to fire service and EMS response times. Twenty-five of the 200 contained information that directly related or provided background information on the subject of this research project. The applicable sources were reviewed, summarized and included in the Literature Review section of this report.

Interviews and Personal Communications

Interviews and personal communications were conducted with five Miami-Dade Fire Rescue personnel. Each was asked open-ended questions pertaining to their area of expertise. They were also asked to provide any suggestions for improving the department's response times.

Barbara Matthews, who is responsible for Planning and Capital Improvement, was interviewed on November 29, 2001. A follow-up interview was conducted on January 24, 2002. Ms. Matthews provided valuable insight on the department's analysis of response time data, how it is used for capital planning, and on sensitive issues relating

to the community's expectations. She also provided suggestions on improving the department's response times.

Fire Communications Division Chief Karl Oltz was interviewed on January 28, 2002. Chief Oltz provided information from the fire alarm dispatcher perspective and how the quality management program was implemented.

Division Chief Jon Wesley was interviewed December 27, 2001 and January 10, 2002. Chief Wesley oversees the Planning and Accreditation Division. He explained how response time data is incorporated into the department's directional and strategic plans. He also discussed how the strategic goals and objectives are set and monitored.

Lidice Cutie, from the department's Fire Management Information Technology Division was interviewed January 11, 2002. Ms. Cutie provided response time data and explained how it is captured and reported. A follow-up conversation took place February 2, 2002 wherein she provided suggestions for improving response times.

IAFF Local 1403 Secretary, Lt. Gary Rainey, who was a Technical Committee member for the development of NFPA 1710, was interviewed on December 6, 2001 and a follow-up conversation was held January 8, 2002. Lt Rainey shared views from the union and technical committee perspectives.

Assumptions and Limitations

Currently, the Miami-Dade Fire Rescue Department does not have the technology to track turnout time and travel time separately. Department representatives who were interviewed expect that the Computer Aided Dispatch system along with Mobile Data Terminals will be implemented in the next two years. They believe that this will improve the department's capabilities for dispatch and monitoring.

NFPA 1710 addresses minimum requirements relating to the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public. This research project examined only fire suppression and EMS response time requirements.

An expected limitation of the research was that very little information was available pertaining to NFPA 1710. NFPA Standard 1710 had just been approved when the author began the project following the National Fire Academy Strategic Management of Change course in late August 2001.

1. What are the components of fire and emergency services response time?

Fire and emergency services literature was reviewed at the Learning Resource Center at the National Fire Academy, the Miami-Dade Fire Rescue Department library, and through Internet searches for response times and NFPA 1710. Personal interviews were conducted with Miami-Dade Fire Rescue Department personnel including: Barbara Matthews Planning and Capital Improvements Bureau, Chief J. Wesley Strategic Management and Accreditation Division, and Lidice Cutie of Miami-Dade Fire Rescue's Fire Management Information Technology Division.

2. What are the response time requirements of NFPA 1710?

NFPA Standard 1710 was reviewed. Additionally, *NFPA 1710: A Decision Guide*, produced by the International Association of Fire Chiefs, which can be downloaded from the IAFC website, was reviewed. Literature reviews of articles pertaining to NFPA 1710 were also conducted. Personal communications were exchanged with Gary Rainey, Dade County Firefighters Local 1403 Secretary and a member of the NFPA 1710 Technical Committee.

3. What are the response times for the Miami-Dade Fire Rescue Department?

Personal interviews with representatives from the Planning and Capital Improvements Bureau, the Fire Communications Division, and Fire Management Information Technology Division of the Miami-Dade Fire Rescue Department were conducted. Response time data, accessed through the department's intranet site was reviewed and analyzed.

4. Is the Miami-Dade Fire Rescue Department presently compliant with the response time requirements of NFPA 1710?

Personal interviews with Ms. Matthews of the Planning and Capital Improvements Bureau and Chief J. Wesley of the Miami-Dade Fire Rescue Strategic Management and Accreditation Division were conducted.

Response time data, accessed directly from the department's intranet site and provided by the Management Information Technology Division was compared to the criteria listed in NFPA 1710.

5. What steps can be taken by the Miami-Dade Fire Rescue Department to comply with the response time requirements of NFPA 1710?

Literature review and information gathered from personal communications with department representatives was used to identify measures that can be implemented to improve the department's response times and to ensure periodic review of the data.

RESULTS

1. What are the components of fire and emergency services response time?

The Commission on Fire Accreditation International (1999) defines response time as the elapsed time from when the call is received until the unit arrives on the scene. Paul

(1995) notes that this method of measurement is what the public expects since they are concerned with a rapid response to their request for assistance.

Wilson (1994) identified nine time intervals for fires. Of those nine, he concludes that only three can be controlled by the fire department. They are the alarm processing step, the turnout time, and the travel time.

Miami-Dade Fire Rescue is currently unable to separate turnout time from travel time. Therefore, for the purposes of this research project, response time will be considered as the time that elapses from the time the call is received by fire department personnel until the arrival time on scene.

2. What are the response time requirements of NFPA 1710?

For fire suppression incidents, NFPA 1710 (2001) requires a company of four firefighters to be on the scene within four minutes and it allows one minute for turnout time. It further requires that a full alarm assignment arrive on the scene within eight minutes. For EMS incidents, the standard requires a four-minute response time for BLS calls and an eight-minute response time for ALS calls. For fire and EMS responses, the performance objective is a minimum of 90 percent.

No distinction is made in the standard to consider the differences in travel time for population density. The varying population density of Miami-Dade County poses unique challenges that must be addressed independently.

3. What are the response times for the Miami-Dade Fire Rescue Department?

Table 1

Comparison of System Response Time to Turnout/Travel Time for MDFRD

Q1-99/00		Q2-99/00		Q3-99/00		Q4-99/00		Q1-00/01		Q2-00/01		Q3-00/11	
AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG
Fire	911	Fire	911	Fire	911	Fire	911	Fire	911	Fire	911	Fire	911
Rcv to	Rcv to	Rcv to	Rcv to	Rcv to	Rcv to	Rcv to	Rcv to	Rcv to	Rcv to	Rcv to	Rcv to	Rcv to	Rcv to
1 st Arr	1 st Arr	1 st Arr	1 st Arr	1 st Arr	1 st Arr	1 st Arr	1 st Arr	1 st Arr	1 st Arr	1 st Arr	1 st Arr	1 st Arr	1 st Arr
6.35	7.25	6.28	7.25	6.29	7.24	6.29	7.27	7.27	8.27	6.24	7.24	6.30	7.30

Table 1 lists average unit response times to life-threatening calls within the Urban Development Boundary for fiscal year 1999/2000 and the first three quarters of fiscal year 2000/2001. The left column shows the average response time including turnout and travel time. The right column shows the average total system response time including the alarm processing step, turnout and travel time.

It was expected that the response times within the Urban Development Boundary would be less than outside the Urban Development Boundary. Table 1, which was made available to the public, shows average response times. However, it does not provide a complete response time picture.

Table 22001 Structure Fires, Five Minutes or Less Response, by Quarter

	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
	<= 5 Min	Total	%	<= 5 Min	Total	%	<= 5 Min	Total	%	<= 5 Min	Total	%
Total	213	670	32%	103	458	22%	108	477	23%	134	492	27%
In UDB	207	632	33%	101	444	23%	102	458	22%	130	468	28%
Outside	6	38	16%	2	14	14%	6	19	32%	4	24	17%

Table 2 displays, by quarter for 2001, the number and percentage of times that Miami-Dade Fire Rescue met the five-minute structure fire response time goals for the initial arriving company listed in NFPA 1710. The 60-second turnout time is included. The total structure fire calls listed include fires within and outside the Urban Development Boundary. The range is from 22%-32%, which is below the 90% required by NFPA 1710.

Table 32001 Structure Fires, Complete Assignment, Nine Minutes or Less by Quarter

	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
	<= 9 Min	Total	%	<= 9 Min	Total	%	<= 9 Min	Total	%	<= 9 Min	Total	%
Total	378	670	56%	283	458	62%	301	477	63%	326	492	66%
In UDB	362	632	57%	281	444	63%	291	458	64%	317	468	68%
Outside	16	38	42%	2	14	14%	10	19	53%	9	24	38%

Table 3 displays, by quarter for 2001, the number and percentage of times that Miami-Dade Fire Rescue met the nine-minute structure fire response time goals for the initial full alarm assignment listed in NFPA 1710. The 60-second turnout time is included. The total structure fire calls listed include fires within and outside the Urban Development Boundary. The range is from 56%-66%, which is below the 90% required by NFPA 1710.

Table 4

2001 Advanced Life Support, Nine Minutes or Less by Quarter

	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
	<= 9 Min	Total	%	<= 9 Min	Total	%	<= 9 Min	Total	%	<= 9 Min	Total	%
Total	32,286	37,983	85%	30,181	35,755	84%	29,588	35,417	84%	29,587	35,601	83%
In UDB	31,643	36,728	86%	29,522	34,511	86%	28,931	34,050	85%	29,002	34,314	85%
Outside	643	1,255	51%	659	1,244	53%	657	1,367	48%	585	1,287	45%

Table 4 displays, by quarter for 2001, the number and percentage of times that Miami-Dade Fire Rescue met the nine-minute advanced life support response time goals listed in NFPA 1710. The 60-second turnout time is included. The total ALS calls listed include calls within and outside the Urban Development Boundary. The range is from 83%-85%. Although the range nears the NFPA 1710 requirements, Miami-Dade Fire Rescue's strategic plan calls for a six-minute response, 80% of the time.

Table 52001 Basic Life Support, Five Minutes or Less by Quarter

	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
	<= 5 Min	Total	%	<= 5 Min	Total	%	<= 5 Min	Total	%	<= 5 Min	Total	%
Total	3,294	15,068	22%	3,140	15,059	21%	3,055	14,727	21%	3,083	15,628	20%
In UDB	3,220	14,569	22%	3,080	14,645	21%	3,002	14,303	21%	3,032	15,167	20%
Outside	74	499	15%	36	414	9%	53	424	13%	51	461	11%

Table 5 displays, by quarter for 2001, the number and percentage of times that Miami-Dade Fire Rescue met the five-minute basic life support response time goals listed in NFPA 1710. The 60-second turnout time is included. The total BLS calls listed include calls within and outside the Urban Development Boundary. The range is from 20%-22%. This range is well below the NFPA 1710 performance requirement of 90%.

Miami-Dade Fire Rescue's strategic plan lists responding to 80% of life threatening calls within the urban development boundary within 6 minutes as one of the main strategic objectives. This objective does not concur with the 5-minute response time, inclusive of turnout time, for 90% of suppression calls as detailed in NFPA 1710. Further, the standard makes no allowances for population density or geographic distances.

K. Oltz (personal communication, January 28, 2002) states that, although the number of calls the department responds to has almost doubled, the number of dispatcher positions has remained constant.

4. Is the Miami-Dade Fire Rescue Department presently compliant with the response time requirements of NFPA 1710?

For structure fires in 2001, the range of 22%-32% compliance for the initial arriving company is well below the 90% required by NFPA 1710. The figures are closer to the standard's requirements for arrival of the initial full alarm assignment, with a range of 56%-66%, compared to the 90% in NFPA 1710.

For EMS calls, the range is 83%-85% for advanced life support calls. However, there is a range of 20%-22% for basic life support calls.

Comparing Miami-Dade Fire Rescue's response times to NFPA 1710 criteria, it is evident that the department is not in compliance with the standard.

5. What steps can be taken by the Miami-Dade Fire Rescue Department to comply with the response time requirements of NFPA 1710?

Miami-Dade Fire Rescue must first revise its strategic plan to reflect the requirements of NFPA 1710. Making the revision will focus attention on the new response time requirements.

The department must continue to monitor and report response times. The results should be made available to all personnel, thereby providing a target for units to aim for.

B. Matthews (personal communication, January 24, 2002) provided several suggestions she believes would contribute to improved response times. The department is in the process of purchasing a new radio communications system that will enable clear communications and avoid the frequent repetition of messages because of poor quality. The department is also in the process of implementing a Computer Aided

Dispatch system with Mobile Data Terminals. Together, the system and terminals will require less radio traffic and reduce the likelihood of incorrect transmissions.

Ms. Matthews also feels that, as part of a quality management program, Battalion Chiefs should be advised when their units have extended response times and provide a written explanation for the delay.

L. Cutie (personal communication, February 3, 2002) gave several suggestions for improving response times, including incorporating Geographic Information Systems (GIS) and Global Positioning Systems on the department's vehicles. This will enable dispatchers to alert the closest unit when the unit is not in quarters. She also suggests that the department analyze the data that her division provides by unit and shift and implement a reward system for the units that show the most improvement on a yearly basis.

The process of determining fire department performance measures is multi-faceted. Response times alone do not provide a comprehensive measure of how well a fire department accomplishes its mission. However, there is little doubt that the more rapidly well-equipped, highly trained people reach the scene of an emergency and begin to mitigate said emergency, the better the likelihood of a positive outcome will be.

DISCUSSION

There has been a great deal of documentation regarding response times in the past ten years. The direct correlation between early access to fire and EMS resources and a positive outcome in mitigating fires and other emergencies cannot be overstressed.

Arguably, NFPA 1710 has stimulated more discussion among those outside the fire service than any other standard in recent history. Community CPR programs and fire

department public education programs have heightened public awareness of the importance of Fire/EMS response times. Local government officials however, were concerned that adoption of the standard would result in more expense to their municipalities. In addition, local governments are opposed to the federal government dictating rules for their jurisdictions.

The 1994 bond issue enabled the department to build needed fire stations that have undoubtedly contributed to improved response times. However, with the growth in Miami-Dade County it is clear that more units and personnel are needed in order to meet the 1710 standard. In addition, inevitable budgetary constraints make it necessary for the department to explore innovative means of improving response times.

Several of the articles reviewed for this research project stressed the fact that response times are but one measure of a department's effectiveness. Hoetmer (1996) suggests that fire control or containment time should be used as a benchmark for measuring a department's effectiveness. Coleman (2001) points out that using response time as the only measure of a department's effectiveness is misleading, especially if people assume the four-minute goal will ensure the fire department arrives four minutes after a fire starts.

Rural/Metro Medical Services (2001) and Wilson (1994) discuss the other factors that are outside the department's control such as the time it takes for someone to realize there is an emergency and the time it takes for them to access 911.

The assumption is that an expeditious response and early implementation of mitigation procedures following an incident with trained, well-equipped responders will facilitate a safe, positive outcome. The author agrees with those findings and considers

that the department is also working to improve its effectiveness and efficiency in other areas.

Using response times as an objective, simple performance measure is necessary in order for a department to evaluate its own effectiveness and for its customers to become aware that the department is willing to look at itself and report its findings.

Mason's (1996) assertion that once flashover occurs, typically within six to nine minutes, damage will be much greater, demonstrates a compelling reason for improving response times.

Pendleton (1999) explains turnout and travel times and discusses some of the factors that affect response times during these two steps. Efforts to improve response times must take these factors into account.

Dawson (1999) suggests that reporting a range of response times would be more readily accepted by the public. In addition, several literature sources reviewed recommend reporting total department response time, which includes alarm processing time. Miami-Dade Fire Rescue currently only reports turnout and travel time.

"The Miami-Dade Fire Rescue Department is keenly aware of the importance of monitoring response times as one measure of its effectiveness" (B. Matthews, personal communication, January 24, 2002). Undoubtedly, IAFF Local 1403 expects the department to comply with NFPA 1710, as was suggested by Secretary Rainey. The author disagrees with Secretary Rainey's position that the collective bargaining agreement requires the department to comply with all NFPA standards. Nonetheless, the department cannot ignore the standard and its implications for safe, effective outcomes to emergency incidents. Coleman (2001) and Hoetmer (1996) however, also

remind readers that response time measurements provide simply a one-dimensional view of fire department effectiveness.

The results of comparing Miami-Dade Fire Rescue's response times for 2001 against the NFPA 1710 criteria shows that the fire department most nearly approximates meeting the nine-minute ALS response time goal, since the range was 83%-85%. However, analysis of the five-minute goal for BLS calls showed a performance measure range of 20%-22%. The 1710 standard requires 90%.

For suppression incidents, the range is 22%-32% for the initial arriving company within five minutes and 56%-66% for arrival of the full initial assignment within nine minutes. NFPA requires 90% performance.

The department's strategic plan serves as a roadmap for accomplishing its mission. The objective that relates to response time calls for a six-minute response to 80% of life threatening calls within the Urban Development Boundary of Miami-Dade County. This objective falls below the expectations of NFPA 1710 (MDFRD, 2001).

RECOMMENDATIONS

Based on the results of the study, Miami-Dade Fire Rescue does not currently meet the response time criteria in NFPA 1710. The first step toward complying with the standard is to conduct a risk analysis to identify areas needing improvement in response times.

The department's strategic plan must be revised to reflect the response time criteria listed in NFPA 1710 and identify action steps to accomplish the goals.

The department should begin to monitor and report response times as described in NFPA 1710, thereby providing a more realistic measure. The reports should be made

available to all department personnel to enable them to actively participate in meeting the response time objectives. A formal quality management program would include this information and provide for the evaluative component.

Miami-Dade Fire Rescue must decide whether it will adopt NFPA 1710 or simply implement it. In either case, an implementation plan must be developed.

Implementing Computer-Aided Dispatch that incorporates technological advances such as GIS, GPS, and Mobile Data Terminals should improve the department's response times and enable the evaluation of response times. The new radio communications system should also contribute to meeting response time goals by requiring less repetition of messages caused by poor reception.

Further research is necessary to identify additional measures that can help improve response times for short, medium, and long range planning.

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